CLAIMS

1. A spin valve sensor for a magnetic head, comprising;

a free layer structure;

an antiparallel (AP) pinned layer structure;

a non-magnetic electrically conductive spacer layer in between the free layer structure and the AP pinned layer structure;

the AP pinned layer structure including;

a first AP pinned layer;

a second AP pinned layer;

an antiparallel coupling (APC) layer formed between the first and the second AP pinned layers;

one of the first and the second AP pinned layers comprising cobalt;

the other of the first and the second AP pinned layers comprising cobalt-iron; and

an antiferromagnetic (AFM) pinning layer for pinning the first AP pinned layer.

2. The spin valve sensor of claim 1, wherein the one AP pinned layer consists of pure cobalt.

3. The spin valve sensor of claim 1, wherein the one AP pinned layer includes no iron content.

4. The spin valve sensor of claim 1, wherein the one AP pinned layer is the first AP pinned layer.

5. The spin valve sensor of claim 1, wherein the one AP pinned layer is the second AP pinned layer.

6. The spin valve sensor of claim 1, wherein the free layer structure comprises a cobalt-iron layer.

7. The spin valve sensor of claim 1, wherein the AFM pinning layer comprises platinum-manganese (PtMn).

8. The spin valve sensor of claim 1, which is a bottom-pinned spin valve sensor wherein the AFM pinning layer is formed below the AP pinned layer structure.

9. The spin valve sensor of claim 1, which is a top-pinned spin valve sensor wherein the AFM pinning layer is formed above the AP pinned layer structure.

10. The spin valve sensor of claim 1, wherein a coercivity Hc of the spin valve sensor is less than 5 Oersteds.

11. The spin valve sensor of claim 1, wherein a $\Delta r/R$ of the spin valve sensor is greater than 12%.

12. A disk drive, comprising:

a housing;

a magnetic disk rotatably supported in that housing;

a magnetic head assembly;

a support mounted in the housing for supporting the magnetic head assembly so as to be in a transducing relationship with the magnetic disk;

a processor connected to the magnetic head assembly, to the spindle motor, and to the actuator for exchanging signals with the magnetic head assembly for controlling movement of the magnetic disk and for controlling the position of the magnetic head assembly;

the magnetic head assembly including a read head;

the read head including a pin valve sensor;

the spin valve sensor comprising:

a free layer structure;

an antiparallel (AP) pinned layer structure;

a non-magnetic electrically conductive spacer layer in between the free layer structure and the AP pinned layer structure;

the AP pinned layer structure including:

a first AP pinned layer;

a second AP pinned layer;

an antiparallel coupling (APC) layer formed between the first and the second AP pinned layer;

one of the first and the second AP pinned layers comprising cobalt;

the other of the first and the second AP pinned layers comprising cobalt-iron; and

an antiferromagnetic (AFM) pinning layer for pinning the first AP pinned layer.

13. The disk drive of claim 12, wherein the one AP pinned layers consists of cobalt.

14. The disk drive of claim 12, wherein the one AP pinned layer includes no iron content.

15. The disk drive of claim 12, wherein the one AP pinned layer is the first AP pinned layer.

16. The disk drive of claim 12, wherein the one AP pinned layer is the second AP pinned layer.

17. The disk drive of claim 12, wherein the free layer structure comprises a cobalt-iron layer.

18. The disk drive of claim 12, wherein the AFM pinning layer comprises platinum-manganese (PtMn).

19. The disk drive of claim 12, which is a bottom-pinned spin valve sensor wherein the AFM pinning layer is formed below the AP pinned layer structure.

20. The disk drive of claim 12, which is a top-pinned spin valve sensor wherein the AFM pinning layer is formed above the AP pinned layer structure.

21. The disk drive of claim 12, wherein a coercivity H_c of the spin valve sensor is less that 5 Oersteds.

22. The disk drive of claim 12, wherein a $\Delta r/R$ of the spin valve sensor is greater than 12%.

23. A method of making a spin valve sensor for a magnetic head, comprising:

forming an antiparallel (AP) pinned layer structure and a free layer structure which are separated by a non-magnetic electrically conductive spacer layer;

forming the AP pinned layer structure with a first AP pinned layer, a second AP pinned layer, an antiparallel coupling (APC) layer;

forming an antiferromagnetic (AFM) pinning layer for pinning the first AP pinned layer;

wherein one of the first and the second AP pinned layers comprises cobalt; and

wherein the other of the first and the second AP pinned layers comprises cobalt-iron.

24. The method of claim 23, wherein the one AP pinned layer consists of cobalt.

25. The method of claim 23, wherein the one AP pinned layer includes no iron content.

26. The method of claim 23, wherein the one AP pinned layer is the first AP pinned layer.

27. The method of claim 23, wherein the one AP pinned layer is the second AP pinned layer.

28. The method of claim 23, wherein the free layer structure is formed with cobalt-iron.

29. The method of claim 23, wherein the AFM pinning layer is formed below the AP pinned layer structure.

30. The method of claim 23, wherein the AFM pinning layer is formed above the AP pinned layer structure.